CLAIMS:

1. A roll crusher assembly for use in the mining industry that includes:

(a) one or more than one roll for crushing a feed material, the roll or rolls having an outer surface that is formed from a wear resistant material; and

(b) a means for depositing a hard facing material onto the surface of the roll or rolls as the roll or rolls rotate during a crushing operation.

2. The roll crusher assembly defined in claim 1 wherein the hard facing material includes any one of (a) iron-based alloys containing one or more of the following alloying elements chromium, manganese, silicon, tungsten, molybdenum, nickel, and vanadium; (b) alloys based on one or more of chromium, nickel, cobalt and tungsten; and (c) composite materials containing particles of hard materials dispersed in a continuous matrix.

3. The roll crusher assembly defined in claim 1 or claim 2 wherein the hard facing deposition means includes a welding means.

4. The roll crusher assembly defined in claim 1 or claim 2 wherein the hard facing deposition means includes a welding means that is positioned in relation to the roll or rolls to deposit the hard facing material onto the surface of the roll or rolls as the roll or rolls rotate during the crushing operation.

5. The roll crusher assembly defined in claim3 or claim 4 wherein the welding means is an arc welding

assembly.

6. The roll crusher assembly defined in any one of the preceding claims wherein the hard facing deposition means is operable to deposit a continuous layer of the hard facing material onto the surface of the roll or rolls.

7. The roll crusher assembly defined in any one of claims 1 to 5 wherein the hard facing deposition means is operable to deposit the hard facing material onto the surface of the roll or rolls only on those sections of the roll or rolls that have become worn to the extent that repair is necessary.

8. The roll crusher assembly defined in any one of the preceding claims wherein the roll or rolls are of the order of 1-3m in diameter.

9. The roll crusher assembly defined in any one of the preceding claims includes a pair of contra-rotating rolls that have a gap therebetween and a means for varying the gap whereby absolute precision is not necessary in respect of the thickness of the hard facing material on the surfaces of the rolls and the main requirement is that all of the roll surfaces that require protection be protected by the hard facing material and there is not an excessive build up of material over time.

10. The roll crusher assembly defined in any one of the preceding claims includes a means for monitoring the surface of the roll or rolls.

11. The roll crusher assembly defined in claim 10 wherein the roll surface monitoring means is adapted to determine the extent of wear on the surface of the roll or rolls.

12. The roll crusher assembly defined in claim 10 or claim 11 wherein the roll surface monitoring means is an optical means.

13. The roll crusher assembly defined in claim 10 or claim 11 wherein the roll surface monitoring means is a laser optical continuous monitoring means that includes a laser system mounted on a frame arranged to minimise vibrations.

14. The roll crusher assembly defined in any one of claims 10 to 13 wherein the hard facing deposition means includes a means that is responsive to the roll surface monitoring means and can actuate the hard facing deposition means to deposit the hard facing material onto the worn sections of the roll or rolls.

15. The roll crusher assembly defined in any one of the preceding claims includes a means for cleaning the surface of the rotating roll or rolls upstream of the hard facing deposition means in the direction of rotation of the roll or rolls.

16. The roll crusher assembly defined in any one of the preceding claims includes a means for heat treating the deposited hard facing material on the rotating roll or rolls downstream of the hard facing deposition means in the direction of rotation of the roll or rolls.

17. A method of repairing a roll or rolls of a roll crusher assembly for use in the mining industry that includes depositing a hard facing material onto the surface of the roll or rolls as the roll or rolls rotate during a crushing operation.

18. The method defined in claim 17 includes

monitoring the surface of the roll or rolls and determining the extent of wear on the surface of the roll or rolls and identifying worn sections of the roll or rolls and depositing the hard facing material onto worn roll sections.